PTI Modification for South End Rotary Calciners 1 through 4
Material Throughput Change

BASF is requesting permit modifications to process an iron-based catalyst product in the South End General Catalyst Lines 1 through 4. The iron-based support material used in the production of this catalyst is denser than the other support materials (e.g., silica and alumina) processed in Lines 1 through 4. As such, the process weight throughput through Lines 1 through 4 will be greater when processing the iron-based catalyst. The permitted emission units (EU) that are potentially affected by processing this material in Lines 1 through 4 include the following:

- P027 – Gen Cat Mixer 1 (insignificant, *de minimis*)
- P028 – Gen Cat Extruder 1 (insignificant, *de minimis*)
- P086 – P&S Dryer 1
- P010 – Rotary Calciner 1
- TMP189513 – Gen Cat Mixer 2 (insignificant, *de minimis*)
- P115 – Gen Cat Extruder 2 (insignificant, *de minimis*)
- P121 – P&S Dryer 2
- P102 – Rotary Calciner 2
- P110 – Gen Cat Mixer 3 (insignificant, *de minimis*)
- P116 – Gen Cat Extruder 3 (insignificant, *de minimis*)
- P122 – P&S Dryer 3
- P103 – Rotary Calciner 3
- P009 – Rotary Calciner 4

The Powder Room (P132), East and West Pfaudler Mixers (P111 and P026), and the National Dryer (P106) are not impacted by this requested change. The density of the iron-based support material is too great for it to be transferred to the processing lines through the pneumatic conveyance of the Power Room. Therefore, the material is loaded directly from super-sacks to the Gen Cat Mixers and then processed through the extruders, P&S Dryers, and calcined. The iron-based catalyst is not a NOx-generating product and is processed at the same volumetric rate (e.g., rotations per minute for the rotary calciners) as the other products. Therefore, the only change in emissions associated with the production of this catalysis is the potential PM emission rate based on the increased process weight rate due to the higher density of the iron-based support material.

Table 1 summarizes the current throughput rates of the affected emission units in comparison to the throughput rates for the iron-based catalyst production. As seen in Table 1, the requested throughput rates for EUs P027, P028, P086, P115, P121, P116, and P122 are not changing, and, therefore, the requested allowable PM emission rate for these units will not change. For all other EUs, the requested throughput rate is increasing. As such, the allowable PM emission rates based on OAC 3745-17-11(B) will increase for these EUs. The mixers (P027, TMP189513, and P110) and extruders (P028, P115, and P116) are insignificant (*de minimis*) EUs that do not have allowable PM emission rates. The uncontrolled PM emission rates for these insignificant EUs based on the increased throughput rate will remain below the *de minimis* thresholds of OAC 3745-15-5. Table 2 provides the current allowable PM emission rates and the requested allowable PM emission rates based on the increased throughput rates and the equation provided in Table I of OAC 3745-17-11. Table 3 provides the current and proposed uncontrolled PM emission rates for comparison with the *de minimis* threshold.

Table 1. Current and Proposed Throughput Rates

EU ID	Description	Current Throughput Rate (lb/hr)	Proposed Throughput Rate (lb/hr)
P027	Gen Cat Mixer 1	1,500	1,500
P028	Gen Cat Extruder 1	1,500	1,500
P086	P&S Dryer 1	1,500	1,500
P010	Rotary Calciner 1	500	1,300
TMP189513	Gen Cat Mixer 2	850	1,300
P115	Gen Cat Extruder 2	1,300	1,300
P121	P&S Dryer 2	1,300	1,300
P102	Rotary Calciner 2	500	1,300
P110	Gen Cat Mixer 3	850	1,300
P116	Gen Cat Extruder 3	1,300	1,300
P122	P&S Dryer 3	1,300	1,300
P103	Rotary Calciner 3	500	1,300
P009	Rotary Calciner 4	833	1,300

Table 2. Permitted and Requested Allowable PM Emission Rates

EU ID	Description	Permitted Allowable PM Emission Rate	Requested Allowable PM Emission Rate	Change in Allowable Emissions	
		(lb/hr)	(lb/hr)	(lb/hr)	(ton/yr)
P027	Gen Cat Mixer 1	none - insignificant EU		0	0
P028	Gen Cat Extruder 1	none - insignificant EU		0	0
P086	P&S Dryer 1	3.38	3.38	0	0
P010	Rotary Calciner 1	1.62	3.07	1.45	6.4
TMP189513	Gen Cat Mixer 2	none - insignificant EU		0	0
P115	Gen Cat Extruder 2	none - insignificant EU		0	0
P121	P&S Dryer 2	3.07	3.07	0	0
P102	Rotary Calciner 2	1.62	3.07	1.45	6.4
P110	Gen Cat Mixer 3	none - insignificant EU		0	0
P116	Gen Cat Extruder 3	none - insignificant EU		0	0
P122	P&S Dryer 3	3.07	3.07	0	0
P103	Rotary Calciner 3	1.62	3.07	1.45	6.4
P009	Rotary Calciner 4	2.28	3.07	0.79	3.5

Table 3. Current and Proposed Daily Uncontrolled PM Emission Rates

Emission Unit	Description	Current Uncontrolled PM Emissions[a] (lb/day)	Proposed Uncontrolled PM Emissions[a] (lb/day)	Emissions Increase Greater *de minimis* (10 lb/day)?
P010	Rotary Calciner 1	316	821	Yes
TMP189513	Gen Cat Mixer 2	1.22	1.87	No
P115	Gen Cat Extruder 2[b]	0	0	No
P121	P&S Dryer 2	20.6	20.6	No
P102	Rotary Calciner 2	316	821	Yes
P110	Gen Cat Mixer 3	1.22	1.87	No
P116	Gen Cat Extruder 3[b]	0	0	No
P122	P&S Dryer 3	20.6	20.6	No
P103	Rotary Calciner 3	316	823	Yes
P009	Rotary Calciner 4	525	819	Yes

a. Current and proposed calciner PM emissions based on site-specific PM emission factor of 52 lb PM/ton material processed.
b. The extruders process a wet material with no potential for PM emissions.